

IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application:

LISTING OF CLAIMS:

1. (Currently Amended) In a computer, a method for obtaining resource usage information from a node of a network, the method comprising the steps of:
generating, for a data element, having (i) a type value for a type parameter within the data element that will cause the node of the network to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter within the data element that will cause the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network receives processes the data element;
sending the data element to the node of the network; and
receiving a signal from the node of the network, the signal including (i) an indication that the node of the network has internally processed the data element as a non-stale data element rather than a stale data element and has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.
2. (Original) The method of claim 1 wherein the node of the network (i) includes multiple resources and (ii) is capable of processing non-stale data elements using different combinations of the multiple resources, and wherein the step of receiving includes the step of:

acquiring, as the resource usage information, a history which identifies a combination of the multiple resources that processed the data element as a non-stale data element.

3. (Currently Amended) The method of claim 1 wherein the time parameter within the data element is a Time-To-Live field, the contents of which identify a limit to the number of remaining nodes which can process the data element within the network, wherein the signal is an Internet Control Message Protocol error message, and wherein the step of receiving includes the step of:

acquiring, as the indication that the node of the network has removed the data element from the network, a notification that the limit to the number of remaining nodes which can process the data element within the network has been reached.

4. (Original) The method of claim 1 wherein the computer includes a database, and wherein the method further comprises the step of:

extracting the resource usage information from the signal;
updating contents of the database with the extracted resource usage information; and
tuning the node of the network based on the updated contents of the database.

5. (Currently Amended) An apparatus for obtaining resource usage information from a node of a network, comprising:

a network interface for connecting to the network; and
a controller coupled to the network interface, the controller being configured to:

generate, for a data element, having (i) a type value for a type parameter within the data element that will cause the node of the network to determine that the data element is

be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter within the data element that will cause the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network receives processes the data element,

send the data element to the node of the network through the network interface, and

receive a signal from the node of the network, the signal including (i) an indication that the node of the network has internally processed the data element as a non-stale data element rather than a stale data element and has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

6. (Original) The apparatus of claim 5 wherein the node of the network (i) includes multiple resources and (ii) is capable of processing non-stale data elements using different combinations of the multiple resources, and wherein the controller includes:

circuitry that acquires, as the resource usage information, a history which identifies a combination of the multiple resources that processed the data element as a non-stale data element.

7. (Currently Amended) The apparatus of claim 5 wherein the time parameter within the data element is a Time-To-Live field, the contents of which identify a limit to the number of remaining nodes which can process the data element

within the network, wherein the signal is an Internet Control Message Protocol error message, and wherein the controller includes:

circuitry that acquires, as the indication that the node of the network has removed the data element from the network, a notification that the limit to the number of remaining nodes which can process the data element within the network has been reached.

8. (Original) The apparatus of claim 5 further comprising:

a memory, coupled to the controller, which stores a database, wherein the controller is configured to:

extract the resource usage information from the signal;
update contents of the database with the extracted resource usage information; and

tune the node of the network through the network interface based on the updated contents of the database.

9. (Currently Amended) A computer program product that includes a computer readable medium having instructions stored thereon for obtaining resource usage information from a node of a network, such that the instructions, when carried out by the computer, cause the computer to perform the steps of:

generating, for a data element, having (i) a type value for a type parameter within the data element that will cause the node of the network to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter within the data element that will cause the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network receives processes the data element;

sending the data element to the node of the network; and

receiving a signal from the node of the network, the signal including (i) an indication that the node of the network has internally processed the data element as a non-stale data element rather than a stale data element and has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

10. (Original) The computer program product of claim 9 wherein the node of the network (i) includes multiple resources and (ii) is capable of processing non-stale data elements using different combinations of the multiple resources, and wherein the step of receiving includes the step of:

acquiring, as the resource usage information, a history which identifies a combination of the multiple resources that processed the data element as a non-stale data element.

11. (Currently Amended) In a node of a network, a method for providing resource usage information, the method comprising the steps of:

receiving a data element from a source computer of the network, the data element having (i) a type value for a type parameter that causes the node of the network to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter that causes the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network processes the data element;

determining that the data element is stale based on a in response to the time value for the time parameter within of the data element;

internally processing the data element as a non-stale data element in response to the type value for the type parameter of the data element; and

removing the data element from the network and sending a signal to the source computer of the network, the signal including (i) an indication that the node of the network has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

12. (Currently Amended) The method of claim 11 wherein the node of the network (i) includes multiple resources and (ii) is capable of processing non-stale data elements using different combinations of the multiple resources, and further comprising the steps of:

~~after the step of determining, processing the data element as a non-stale data element using a combination of the multiple resources; and~~

generating, as the resource usage information, a history which identifies the combination of the multiple resources that processed the data element as a non-stale data element.

13. (Currently Amended) The method of claim 11 wherein the time parameter within the data element is a Time-To-Live field, the contents of which identify a limit to the number of remaining nodes which can process the data element within the network, wherein the step of determining includes the step of:

updating a value defined by the contents of the Time-To-Live field of the data element to determine that the limit to the number of remaining nodes which can process the data element within the network has been reached, and

wherein the step of removing and sending includes the step of:

providing, as the signal to the source computer of the network, an Internet Control Message Protocol error message.

14. (Original) The method of claim 11 wherein the node of the network is capable of processing data elements based on a tuning attribute, and wherein the method further comprises the steps of:

receiving, from the source computer, a tuning command based on the resource usage information; and

adjusting the tuning attribute based on the tuning command in order to change a manner in which the node processes data elements.

15. (Currently Amended) A network node for providing resource usage information, comprising:

a network interface for connecting to a network;

a controller coupled to the network interface, the controller being configured to:

receive a data element from a source computer of the network through the network interface, the data element having (i) a type value for a type parameter that causes the node of the network to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter that causes the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network processes the data element;

determine that the data element is stale based on a in response to the time value for the time parameter within of the data element;

internally process the data element as a non-stale data element in response to the type value for the type parameter of the data element; and

remove the data element from the network and send a signal to the source computer of the network through the network

interface, the signal including (i) an indication that the node of the network has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

16. (Currently Amended) The network node of claim 15 wherein the controller includes:

multiple resources; and

a control module, coupled to the multiple resources, which is capable of processing non-stale data elements using different combinations of the multiple resources, the control module being configured to:

~~process the data element as a non-stale data element using a combination of the multiple resources, and~~

generate, as the resource usage information, a history which identifies the combination of the multiple resources that processed the data element as a non-stale data element.

17. (Currently Amended) The network node of claim 15 wherein the time parameter within the data element is a Time-To-Live field, the contents of which identify a limit to the number of remaining nodes which can process the data element within the network, and wherein the controller includes:

circuitry that (i) updates a value defined by the contents of the Time-To-Live field of the data element to determine that the limit to the number of remaining nodes which can process the data element within the network has been reached, and (ii) provides, as the signal to the source computer of the network, an Internet Control Message Protocol error message.

18. (Original) The network node of claim 15 wherein the controller is capable of processing data elements based on a tuning attribute, and wherein the controller includes:

circuitry that (i) receives, from the source computer through the network interface, a tuning command based on the resource usage information, and (ii) adjusts the tuning attribute based on the tuning command in order to change a manner in which the controller processes data elements.

19. (Currently Amended) A computer program product that includes a computer readable medium having instructions stored thereon for providing resource usage information, such that the instructions, when carried out by a computerized device, cause the computerized device to perform the steps of:

receiving a data element from a source computer of the network, the data element having (i) a type value for a type parameter that causes the computerized device to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter that causes the computerized device to determine that the data element is stale to prevent subsequent transmission of the data element from the computerized device when the computerized device processes the data element;

determining that the data element is stale ~~based on a~~ in response to the time value of the time parameter ~~within~~ of the data element;

internally processing the data element as a non-stale data element in response to the type value for the type parameter of the data element; and

removing the data element from the network and sending a signal to the source computer of the network, the signal including (i) an indication that the computerized device has removed the data element from the network, and (ii) resource usage information describing usage of resources within the computerized device when the computerized device internally processed the data element as a non-stale data element.

20. (Currently Amended) The computer program product of claim 19 wherein the computerized device (i) includes multiple resources and (ii) is capable of processing non-stale data elements using different combinations of the multiple resources, and wherein the instruction further cause the computerized device to perform the steps of:

~~after the step of determining, processing the data element as a non-stale data element using a combination of the multiple resources; and~~

generating, as the resource usage information, a history which identifies the combination of the multiple resources that processed the data element as a non-stale data element.

21. (Currently Amended) A system for obtaining resource usage information, comprising:

a source computer which provides a data element; and

a network node, coupled to the source computer, which forms at least a portion of a network with the source computer, the network node being configured to:

receive the data element from the source computer,
the data element having (i) a type value for a type parameter
that causes the node of the network to determine that the
data element is be internally processed as a non-stale data
element rather than a stale data element, and (ii) a time
value for a time parameter that causes the node of the
network to determine that the data element is stale to
prevent subsequent transmission of the data element from
the node of the network when the node of the network
processes the data element;

determine that the data element is stale based on a in
response to the time value for the time parameter within of
the data element;

internally process the data element as a non-stale data element in response to the type value for the type parameter of the data element; and

remove the data element from the network and send a signal to the source computer, the signal including (i) an indication that the network node has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the network node when the node of the network internally processed the data element as a non-stale data element.

22. (Original) The system of claim 21 wherein the network node includes: multiple resources; and

a control module, coupled to the multiple resources, which is capable of processing non-stale data elements using different combinations of the multiple resources, the control module being configured to:

process the data element provided by the source computer as a non-stale data element using a combination of the multiple resources, and

generate, as the resource usage information, a history which identifies the combination of the multiple resources that processed the data element as a non-stale data element.

23. (Currently Amended) The system of claim 21 wherein the time parameter within the data element is a Time-To-Live field, the contents of which identify a limit to the number of remaining nodes which can process the data element within the network, and wherein the network node includes:

circuitry that (i) updates a value defined by the contents of the Time-To-Live field of the data element to determine that the limit to the number of

remaining nodes which can process the data element within the network has been reached, and (ii) provides, as the signal to the source computer of the network, an Internet Control Message Protocol error message.

24. (Original) The system of claim 21 wherein the source computer includes:
 - a memory which stores a database; and
 - a controller, coupled to the memory, which is configured to:
 - extract the resource usage information from the signal,
 - update contents of the database with the extracted resource usage information, and
 - generate a tuning command based on the updated contents of the database, and send the tuning command to the network node; and
- wherein the network node is capable of processing data elements based on a tuning attribute, and wherein the network node includes:
 - circuitry that (i) receives, from the source computer, the tuning command, and (ii) adjusts the tuning attribute based on the tuning command in order to change a manner in which the network node processes data elements.
25. (Previously Presented) The method of claim 1 wherein the node is an intermediate device disposed between the computer and a target device, and wherein the step of sending the data element to the node includes the step of:
 - formatting the data element as a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the node to consider the data element to be a stale packet upon receipt of the data element by the node.
26. (Previously Presented) The apparatus of claim 5 wherein the node is an intermediate device disposed between the apparatus and a target device; and

wherein the controller, when sending the data element to the node, is configured to:

format the data element as a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the node to consider the data element to be a stale packet upon receipt of the data element by the node.

27. (Previously Presented) The computer program product of claim 9 wherein the node is an intermediate device disposed between the apparatus and a target device; and wherein the instructions, when causing the computer to send the data element to the node, cause the computer to:

format the data element as a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the node to consider the data element to be a stale packet upon receipt of the data element by the node.

28. (Previously Presented) The method of claim 11 wherein the node is an intermediate device disposed between the source computer and a target device; and wherein the step of receiving includes the step of:

obtaining, as the data element, a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the node to consider the data element to be a stale packet.

29. (Previously Presented) The network node of claim 15 wherein the node is an intermediate device disposed between the source computer and a target device; and wherein controller, when receiving the data element, is configured to:

obtaining, as the data element, a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the network node to consider the data element to be a stale packet.

30. (Previously Presented) The computer program product of claim 19 wherein the computerized device is an intermediate device disposed between the source computer and a target device; and wherein the instructions, when causing the computerized device to receive the data element, cause the computerized device to:
obtain, as the data element, a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the computerized device to consider the data element to be a stale packet.
31. (Previously Presented) The system of claim 21 wherein the network node is an intermediate device disposed between the source computer and a target device; and wherein network node, when receiving the data element, is configured to:
obtain, as the data element, a packet having (i) a destination address that identifies the target device and (ii) a Time-To-Live value which causes the network node to consider the data element to be a stale packet.
32. (Previously Presented) The method of claim 1 wherein the step of sending the data element to the node includes the step of:
providing, within the data element, a destination address which targets a device that is different than the node to route the data element in a direction leading to the device through the node.
33. (Previously Presented) The method of claim 32 wherein the step of receiving the signal includes the step of:
obtaining, as the signal, a packetized communication having a history which identifies processing of the data element as a non-stale data element by the node even though the data element is stale by the time the node receives the data element.

34. (Previously Presented) The apparatus of claim 5 wherein the controller, when sending the data element to the node, is configured to:

provide, within the data element, a destination address which targets a device that is different than the node to route the data element in a direction leading to the device through the node.

35. (Previously Presented) The apparatus of claim 34 wherein controller, when receiving the signal, is configured to:

obtain, as the signal, a packetized communication having a history which identifies processing of the data element as a non-stale data element by the node even though the data element is stale by the time the node receives the data element.

36. (Previously Presented) The method of claim 11 wherein the step of receiving the data element includes the step of:

obtaining, within the data element, a destination address which targets a device that is different than the node to route the data element in a direction leading to the device through the node.

37. (Previously Presented) The method of claim 32 wherein the step of removing the data element from the network and sending the signal includes the step of:

providing, as the signal, a packetized communication having a history which identifies processing of the data element as a non-stale data element by the node even though the data element is stale by the time the node receives the data element.

38. (Previously Presented) The network node of claim 15 wherein the controller, when receiving the data element, is configured to:

obtain, within the data element, a destination address which targets a device that is different than the node to route the data element in a direction leading to the device through the node.

39. (Previously Presented) The network node of claim 38 wherein the controller, when removing the data element from the network and sending the signal, is configured to:

provide, as the signal, a packetized communication having a history which identifies processing of the data element as a non-stale data element by the node even though the data element is stale by the time the node receives the data element.

40. (Previously Presented) The system of claim 21 wherein the network node, when receiving the data element, is configured to:

obtain, within the data element, a destination address which targets a device that is different than the node to route the data element in a direction leading to the device through the node.

41. (Currently Amended) An apparatus for obtaining resource usage information from a node of a network, comprising:

a network interface for connecting to the network; and
a controller coupled to the network interface, the controller having:
generating means for generating, for a data element,
having (i) a type value for a type parameter within the data
element that will cause the node of the network to determine
that the data element is be internally processed as a non-
stale data element rather than a stale data element, and (ii)
a time value for a time parameter within the data element
that will cause the node of the network to determine that the
data element is stale to prevent subsequent transmission of

the data element from the node of the network when the node of the network receives processes the data element, sending means for sending the data element to the node of the network through the network interface, and receiving means for receiving a signal from the node of the network, the signal including (i) an indication that the node of the network has internally processed the data element as a non-stale data element rather than a stale data element and has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

42. (Currently Amended) A network node for providing resource usage information, comprising:

a network interface for connecting to a network;

a controller coupled to the network interface, the controller having:

receiving means for receiving a data element from a source computer of the network through the network interface, the data element having (i) a type value for a type parameter that causes the node of the network to determine that the data element is be internally processed as a non-stale data element rather than a stale data element, and (ii) a time value for a time parameter that causes the node of the network to determine that the data element is stale to prevent subsequent transmission of the data element from the node of the network when the node of the network processes the data element;

determining means for determining that the data element is stale ~~based on a~~ in response to the time value for the time parameter within of the data element; and

processing means for internally processing the data element as a non-stale data element in response to the type value for the type parameter of the data element, removing the data element from the network and sending a signal to the source computer of the network through the network interface, the signal including (i) an indication that the node of the network has removed the data element from the network, and (ii) resource usage information describing usage of resources within by the node of the network when the node of the network internally processed the data element as a non-stale data element.

43. (Newly Added) The method of claim 33 wherein the step of obtaining includes the step of:

acquiring a bit pattern within the packetized communication, the bit pattern including a series of bits, each bit in the series corresponding to a respective resource of the node of the network; wherein, when that bit is set, the bit pattern indicates usage of the respective resource by the node of the network when processing the data element and, when that bit is clear, the bit pattern indicates no usage of the respective resource by the node of the network when processing the data element.